

**AMENDEMENTS TO THE CLAIMS**

Claims 1-25 (Canceled)

26. (Currently Amended) A targeting construct capable of producing a disruption in a melanocyte stimulating hormone receptor gene represented by SEQ ID NO:19, the targeting construct comprising:

- (a) a first polynucleotide sequence homologous to a first portion of ~~a~~ the melanocyte stimulating hormone receptor gene represented by SEQ ID NO:19;
- (b) a second polynucleotide sequence homologous to a second portion of the melanocyte stimulating hormone receptor gene; and
- (c) a selectable marker gene located between the first polynucleotide sequence and the second polynucleotide sequence,

~~wherein the targeting construct, when introduced into a murine embryonic stem cell, results in a transgenic mouse having produces a disruption in the melanocyte stimulating hormone receptor gene, wherein the transgenic mouse when homozygous for the disruption, when present in a transgenic mouse in a homozygous state, inhibits in a melanocyte stimulating hormone receptor gene lacks production of functional protein encoded by the melanocyte stimulating hormone receptor gene and the transgenic mouse exhibits resulting in hypoactivity.~~

27. (Canceled)

28. (Currently Amended) A method of producing a targeting construct ~~for capable of disrupting~~ a melanocyte stimulating hormone receptor gene represented by SEQ ID NO: 19, the method comprising:

- (a) obtaining a first polynucleotide sequence homologous to a first region of the melanocyte stimulating hormone receptor gene;
- (b) obtaining a second polynucleotide sequence homologous to a second region of the melanocyte stimulating hormone receptor gene;
- (c) providing a vector comprising a selectable marker; and
- (d) inserting the first and second sequences into the vector to produce the targeting construct,

wherein the targeting construct, when introduced into a murine embryonic stem cell, results in a transgenic mouse having produces a disruption in the melanocyte stimulating hormone receptor gene, wherein the transgenic mouse when homozygous for the disruption, when present in a transgenic mouse in a homozygous state, inhibits lacks production of functional protein encoded by the melanocyte stimulating hormone receptor gene and the transgenic mouse exhibits resulting in hypoactivity.

29. (Currently Amended) A method of producing a targeting construct for capable of disrupting a melanocyte stimulating hormone receptor gene represented by SEQ ID NO: 19, the method comprising:

- (a) providing a polynucleotide sequence homologous to the melanocyte stimulating hormone receptor gene;
- (b) generating two different fragments of the polynucleotide sequence;
- (c) providing a vector having a gene encoding a selectable marker; and
- (d) inserting the two different fragments into the vector to form the targeting construct, wherein the targeting construct, when introduced into a murine embryonic stem cell, results in a transgenic mouse having produces a disruption in the melanocyte stimulating hormone receptor gene, wherein the transgenic mouse when homozygous for the disruption, when present in the homozygous state, inhibits lacks production of functional protein encoded by the melanocyte stimulating hormone receptor gene and the transgenic mouse exhibits resulting in hypoactivity.

30. (Currently Amended) A method of producing a transgenic mouse comprising a homozygous disruption in a melanocyte stimulating hormone receptor gene represented by SEQ ID NO: 19, the method comprising:

- (a) introducing a targeting construct targeting the melanocyte stimulating hormone receptor gene into a murine embryonic stem cell;
- (b) introducing the embryonic stem cell into a blastocyst;
- (c) implanting the resulting blastocyst into a pseudopregnant mouse, wherein the pseudopregnant mouse gives birth to a chimeric mouse; and

- (d) breeding the chimeric mouse to produce the a transgenic mouse comprising a heterozygous disruption in the melanocyte stimulating hormone receptor gene; and
- (e) breeding the transgenic mouse comprising the heterozygous disruption to produce the transgenic mouse comprising a homozygous disruption in the melanocyte stimulating hormone receptor gene,

wherein the transgenic mouse when homozygous for the disruption lacks production of functional protein encoded by the melanocyte stimulating hormone receptor gene and the transgenic mouse exhibits hypoactivity.

31. (Cancelled)

32. (Previously Amended) A transgenic mouse comprising a disruption in a melanocyte stimulating hormone receptor gene represented by SEQ ID NO: 19, wherein where the disruption is homozygous the transgenic mouse lacks production of functional protein encoded by the melanocyte stimulating hormone receptor gene and the transgenic mouse exhibits hypoactivity.

33. (Previously Added) A cell or tissue isolated from the transgenic mouse of claim 32.

34. (Cancelled)

35. (Previously Amended) A murine embryonic stem cell transformed with the targeting construct of claim 26.